

	Disinfection Byproducts- TTHM's (MCL- .080 mg/L) and HAA5's (MCL- .060 mg/L)				
	Surface water > 10,000	Surface water <10,000 & ≥500	Surface water < 500	Groundwater > 10,000	Groundwater < 10,000
<b>Who must Sample?</b>	All community and non-transient non-community systems that add a chemical disinfectant to the water in any part of the drinking water process				
<b>Effective Date</b>	January 1, 2002	January 1, 2004	January 1, 2004	January 1, 2004	January 1, 2004
<b>Routine Monitoring</b>	4 samples per quarter per plant 25 % at max res. the rest at avg. res. time	1 sample per quarter per plant at max. res.	1 sample per year per plant in month of warmest water temp. If sample or avg. of annual samples exceeds MCL, then increase to 1 sample per quarter per plant. *	1 sample per quarter per plant at max. res.	1 sample per year per plant in month of warmest water temp. If sample or avg. of annual samples exceeds MCL, then increase to 1 sample per quarter per plant. *
<b>Reduced Monitoring Criteria (Annual avg. of 1 Yr's Data)</b>	Source water TOC ≤ 4 mg/L plus: TTHM's ≤ .040 mg/L HAA5's ≤ .030 mg/L	Source water TOC ≤ 4 mg/L plus: TTHM's ≤ .040 mg/L HAA5's ≤ .030 mg/L	* If on increased monitoring: TTHM's ≤ .060 mg/L and HAA5's ≤ .045 mg/L to return to routine monitoring	TTHM's ≤ .040 mg/L and HAA5's < .030 mg/L	TTHM's ≤ .040 mg/L and HAA5's ≤ .030 mg/L For 2 cons. Years <b>OR</b> TTHM's ≤ .020 mg/L and HAA5's ≤ .015 mg/L for 1 yr.
			No reduced monitoring available		
<b>Reduced Monitoring</b>	1 sample per quarter per plant at max. res.	1 per year per plant in month of warmest water temp. at max. res.	N/A	1 per year per plant in month of warmest water temp. at max. res.	1 per 3 years per plant in month of warmest water temp. at max. res.
<b>Return to Routine Monitoring if</b>	TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L	TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L		TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L	TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L
<b>Compliance Requirements</b>	Failure to monitor is a monitoring violation for the entire annual average period  If system fails to complete 4 consecutive quarters of monitoring, then compliance will be based on the average of the available data	<b>For quarterly monitoring</b> , compliance is based on a running annual average, computed quarterly, of quarterly averages of all samples collected  <b>For less than quarterly monitoring</b> , compliance is based on all samples taken that year. If the yearly average exceeds the MCL, then system must increase to quarterly monitoring. The system then would not be out of compliance until 1 year of quarterly monitoring is completed, unless the result of fewer than 4 quarters of monitoring will cause		the running annual average to exceed the MCL . The system would then be in violation at the end of the quarter. If you are required to increase to quarterly samples, then the sample that initially exceeded the MCL must be included in the running annual average with the following 3 samples.  If the running annual average of any 4 consecutive quarters exceeds the MCL, then the system is in violation and must notify the DDW and the public.	
<b>Reporting Requirements</b>	<b>If a system monitors quarterly or more often</b> , reports are due 10 days after quarter ends.	<b>If monitoring quarterly or more often</b> , report: - Number of samples taken - Locations, dates, and results of all samples - Avg. of all quarterly samples - Avg. of last 4 quarterly avgs. - If MCL was violated	<b>If Monitoring less than quarterly</b> , report is due 10 days after monitoring period ends.	<b>If monitoring less than quarterly but at least annually</b> , you shall report: - Number of samples taken - Locations, dates, and results - Average of all samples - If MCL was violated	<b>If monitoring less than annually</b> , you shall report: - Location, date, and result of last sample - If MCL was violated

	Disinfection Byproducts	
	Chlorite- MCL 1.0 mg/L	Bromate- MCL .010 mg/L
<b>Who Must Sample?</b>	All community and non-transient non-community systems using chlorine dioxide for disinfection or oxidation.	All community and non-transient non-community systems using ozone for disinfection or oxidation
<b>Effective Date</b>	<b>January 1, 2002</b> for all community and non-transient non-community surface water systems over 10,000 <b>January 1, 2004</b> for all other community and non-transient non-community systems	
<b>Routine Monitoring</b>	Daily sampling at entrance to distribution system Plus: One three-set sample per month <ul style="list-style-type: none"> <li>- 1 near first customer</li> <li>- 1 at average residence time</li> <li>- 1 at max. residence time.</li> <li>- May use additional monitoring to meet this</li> </ul>	1 sample per month per plant at entrance to distribution system while ozonation is operating under normal circumstances
<b>Additional Monitoring</b>	If daily sample exceeds the MCL, then a three-set sample must be taken at the same locations as the monthly sample. This is taken the following day.	
<b>Reduced Monitoring</b>	Daily sample can't be reduced  Monthly sample can be reduced to 1 3-sample set per quarter, if no routine monitoring exceeds MCL for 1 yr.  System must return to routine monitoring if MCL is exceeded on any sample.	1 sample per quarter per plant  - Only if Bromide in source water is < .05 mg/L based on monthly samples for a year. - System must continue testing for Bromide monthly. If the Bromide running annual average, computed quarterly based on monthly tests, is $\geq$ .05, then the system must return to routine monitoring.
<b>Compliance</b>	Compliance is based on an average of all 3-sample sets taken in the distribution system. If the average exceeds the MCL, the system is in violation and shall notify the public and DDW	Failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.  Compliance is based on a running annual average, computed quarterly, of monthly samples that includes all samples taken during the month. If average of any consecutive 4-quarter period exceeds the MCL, then the system is in violation and shall notify the public and DDW. If a system failed to have 12 consecutive months of monitoring, then compliance is based on the average of the available data.
<b>Reporting</b>	Due quarterly, 10 days after quarter ends, and shall include: - Number of entry point samples taken each month for the last three months of the calendar quarter - Locations, dates, and results of each sample taken in both entry and distribution system - Average of all 3-sample sets taken in the distribution system for each month - Whether MCL was violated	Due quarterly, 10 days after quarter ends, and shall include: - Number of samples taken last quarter - Location, date, and result for each sample taken - An average of the monthly averages on all samples taken in the last year - Whether MCL was violated
<b>Monitoring Plan</b>	All systems must develop a monitoring plan and have it available for inspection by the DDW and the public. Surface water systems > 3,300 must submit their plan to the DDW.	

	Residual Disinfectant Levels	
	Chlorine & Chloramines (MRDL- 4.0 mg/L)	Chlorine Dioxide (MRDL- 0.8 mg/L)
<b>Who Must Sample?</b>	All community and non-transient non-community systems using chlorine or chloramines	All community, non-transient non-community, and transient non-community systems that use chlorine dioxide for disinfection or oxidation
<b>Effective Date</b>	<b>January 1, 2002</b> for all community and non-transient non-community surface water systems over 10,000 <b>January 1, 2004</b> for all other community and non-transient non-community systems	Dates for community and NTNC are the same as chlorine For transient non-community: <b>January 1, 2002</b> for surface water systems over 10,000 <b>January 1, 2004</b> for all other transient systems
<b>Routine Monitoring</b>	3 residual disinfection level (RDL) samples per week minimum RDL must be measured in distribution system at the same time and location as the total coliform sample, including routine, repeat, and additional samples Surface water systems that filter may use the results of RDL sampling for 309-215-10(3)	Daily sampling at entrance to the distribution system
<b>Additional Monitoring</b>	Ground water systems must take the following readings a minimum of 3 times per week: - Total volume of water treated - Type and amount of disinfectant used, clearly indicating weight if gas feeders are used, or percent solution and volume fed if liquid feeders are used - Setting of rotometer valve or injector pump	On days following MRDL exceedances, system must take 3 distribution system samples If there are no disinfectant booster stations, then samples should be taken as close to first customer as possible, at intervals of at least 6 hours If chlorine is used to maintain a distribution system residual, and there is at least 1 booster station: take 1 sample as close to first customer as possible, 1 sample at average residence time, and 1 at maximum residence time
<b>Reduced Monitoring</b>	No reduced monitoring	No reduced monitoring
<b>Compliance</b>	Failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Compliance is based on a running annual average, computed quarterly, of monthly samples that includes all samples taken during the month. If average of any consecutive 4-quarter period exceeds the MRDL, then the system is in violation and shall notify the public and DDW. If both chlorine and chloramines are used, compliance is based on all results of both	<b>Acute:</b> If daily sample exceeds MRDL, and 1 or more of the dist. Samples on the following day exceed the MRDL, then the system is in violation and must take immediate action to lower the levels. The system also must notify the public and DDW pursuant to acute health risks (R309-220-5). Failure to monitor following a daily exceedance is an acute MRDL violation. <b>Non-acute:</b> If two consecutive daily samples exceed MRDL, and no dist. samples do, then system is in violation and must lower the levels. The public and DDW must be notified pursuant to non-acute health risks (R309-220-5). Failure to monitor is also a violation
<b>Reporting</b>	Due quarterly, 10 days after month ends Report shall include: - Number of samples taken each month of last quarter - Monthly average of all samples taken each month for the last 12 months - Average of all monthly averages for the last 12 months - If MRDL was violated - The additional monitoring data required for ground water systems	Due quarterly, 10 days after quarter ends Report shall include: - Dates, results, and locations of samples taken - If MRDL was violated - If MRDL was violated in two consecutive daily samples, and if it was an acute or non-acute violation
<b>Monitoring Plan</b>	All systems must develop a monitoring plan and have it available for inspection by the DDW and the public. Surface water systems > 3,300 must submit their plan to the DDW.	

	Disinfection Byproducts Precursor				
	Total Organic Carbon (TOC)				
Who Must Sample?	Surface water systems which use conventional filtration treatment (R309-110)				
Effective Date	January 1, 2002 for Surface water systems > 10,000 January 1, 2004 for Surface water systems < 10,000				
Routine Monitoring	1 paired TOC sample and one source water alkalinity sample per month per plant Samples must be taken during normal operating and water quality conditions. The paired TOC sample must have one taken from untreated source water and one at the combined filter effluent. These samples must be taken at the same time.				
Reduced Monitoring Criteria	Finish TOC < 2.0 mg/L for 2 consecutive years <b>OR</b> Finish TOC < 1.0 mg/L for 1 year as an annual average				
Reduced Monitoring	1 TOC paired sample and 1 source water alkalinity sample per quarter				
Return To Routine Monitoring If	Annual Average Finish TOC ≥ 2.0 mg/L System must revert back to routine monitoring in the month following the quarter when the annual average TOC was exceeded				
Compliance	Systems shall operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels (step 1) unless the system meets at least one of the alternate compliance criteria below. If a system is required to meet step 1 or step 2 levels, and the calculated value is less than 1.0, the system is in violation and must notify the public and DDW (R309-220, R309-105-16). Systems may begin monitoring to determine whether step 1 TOC removals can be met 12 months prior to the compliance date. This is not required, but any system that does not monitor during this period and then finds in the first 12 months after the compliance date it can't meet step 1 TOC removals, and must therefore apply for step 2 removal levels, is not eligible for retroactive approval and is in violation.	STEP 1	TOC Required Removal		
		Source water	Source Water Alkalinity (mg/L)		
		TOC (mg/L)	0-60	>60-120	>120
		>2.0-≤4.0	35.00%	25.00%	15.00%
		>4.0-≤8.0	45.00%	35.00%	25.00%
		>8.0	50.00%	40.00%	30.00%
Compliance Calculations	Calculated Quarterly, after 12 months of data are collected 1. Determine actual monthly TOC removal equal to: (1- (treated TOC/ source TOC)) x 100 2. Determine required TOC percent removal from step 1 chart or step 2 approved level 3. Divide actual TOC removal by required TOC removal 4. Add results for the last 12 months and divide by 12- this will give your compliance value	<b>Note 1:</b> Systems meeting at least one of the alternate compliance options are not required to operate with enhanced coagulation			
		<b>Note 2:</b> Softening systems meeting one of the additional alternate compliance criteria are not required to operate with enhanced softening			
		<b>Note 3:</b> Systems practicing softening shall meet the TOC removal requirements in the far right column (>120 mg/L)			
Alternate Compliance (Calculated Quarterly as a Running Average)	Systems may use any of these options to comply in lieu of step 1 removal levels 1. Source water TOC level is less than 2.0 mg/L 2. Treated water TOC level is less than 2.0 mg/L 3. Source water TOC < 4.0 mg/L, source water alkalinity > 60 mg/L, TTHM's ≤ .040 mg/L, and HAA's ≤ .030 mg/L 4. TTHM's ≤ .040 mg/L, HAA's ≤ .030 mg/L, and system 's only disinfectant is chlorine 5. Source water SUVA is less than or equal to 2.0 L/mg-m 6. Treated water SUVA is less than or equal to 2.0 L/mg-m				
Additional Alternate Compliance (Calculated as above)	Systems practicing enhanced softening that can't achieve step 1 TOC removals, may use the following criteria to comply: 1. Softening that results in lowering treated water alkalinity < 60 mg/L measured monthly 2. Softening that results in removing at least 10 mg/L of Mg hardness measured monthly				
Alternate Minimum Removal (Step 2)	Systems that cannot meet step 1 TOC removals or alternate compliance criteria, shall apply to DDW for approval of alternate minimum removal levels. This application shall include, at a minimum, bench or pilot-scale testing results. See rule R309-215-13(2)(c) for details				
Reporting (Quarterly)	Systems using step 1 or 2 shall report the #, location, date, and results of all samples, the avg. % removal for each sample and avg. of all samples, and calculations to verify compliance	Systems using alternate compliance criteria shall report the #, location, date and results of all samples, which criterion is used, and calculations to determine compliance			

	Surface water TTHM's (MCL-.080 mg/L) and HAA5's (MCL-.060 mg/L)		
	Surface water > 10,000	Surface water <10,000 & ≥500	Surface water < 500
<b>Who must Sample?</b>	All community and non-transient non-community systems that add a chemical disinfectant to the water in any part of the drinking water process		
<b>Effective Date</b>	<b>January 1, 2002</b>	<b>January 1, 2004</b>	<b>January 1, 2004</b>
<b>Routine Monitoring</b>	4 samples per quarter per plant 25 % at maximum residence time, the rest at average res.	1 sample per quarter per plant at maximum residence time	1 sample per year per plant in month of warmest water temp. If sample or avg. of annual samples exceeds MCL, then increase to 1 sample per quarter per plant. *
<b>Reduced Monitoring Criteria</b>	Source water TOC ≤ 4 mg/L plus: TTHM's ≤ .040 mg/L HAA5's ≤ .030 mg/L Annual average of 1 years data	Source water TOC ≤ 4 mg/L plus: TTHM's ≤ .040 mg/L HAA5's ≤ .030 mg/L Annual average of 1 years data	* If on increased monitoring: TTHM's ≤ .060 mg/L and HAA5's ≤ .045 mg/L Annual average of 1 years data to return to routine monitoring
			No reduced monitoring available
<b>Reduced Monitoring</b>	1 sample per quarter per plant at maximum residence time	1 sample per year per plant in month of warmest water temp. at maximum residence time	N/A
<b>Return to Routine Monitoring if:</b>	TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L	TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L	N/A
<b>Compliance</b>	<p>Failure to monitor is a monitoring violation for the entire annual average period. If a system fails to complete 4 consecutive quarters of monitoring, then compliance will be based on the average of the available data.</p> <p><b>For quarterly monitoring</b>, compliance is based on a running annual average, computed quarterly, of quarterly averages of all samples collected.</p> <p><b>For less than quarterly monitoring</b>, compliance is based on all samples taken that year.</p> <p>If the yearly average exceeds the MCL, then the system must increase to quarterly monitoring. The system then would not be out of compliance until 1 year of quarterly monitoring is completed, unless the result of fewer than 4 quarters of monitoring will cause the running annual average to exceed the MCL. The system would then be in violation at the end of the quarter. If you are required to increase to quarterly samples, then the sample that initially exceeded the MCL must be included in the running annual average with the following three samples. If the running annual average of any 4 consecutive quarters exceeds the MCL, then the system is in violation and must notify the DDW and the public.</p>		
<b>Reporting</b>	<p><b>If system monitors quarterly or more often</b>, reports are due 10 days after the quarter ends.</p> <p><b>If monitoring quarterly or more often</b>, report: number of samples taken, locations, dates, and results of all samples, average of all samples, and whether the MCL was violated.</p> <p><b>If system monitors less than quarterly</b>, report is due 10 days after monitoring period ends.</p> <p><b>If system monitors less than quarterly but at least annually</b>, you shall report: number of samples taken, locations, dates, and results of all samples, average of all samples, and whether MCL was violated.</p> <p><b>If monitoring less than annually</b>, you shall report: location, date, and result of last sample, and whether MCL was violated.</p>		
<b>Monitoring Plan</b>	<p>All systems must develop a monitoring plan and have it available for inspection by the DDW and the public.</p> <p>Surface water systems &gt; 3,300 must submit their plan to the DDW.</p>		

	<b>Groundwater TTHM's (MCL- .080 mg/L) and HAA5's (MCL-.060 mg/L)</b>	
	<b>Groundwater &gt; 10,000</b>	<b>Groundwater &lt; 10,000</b>
<b>Who Must Sample?</b>	All community and non-transient non-community systems that add a chemical disinfectant to the water in any part of the drinking water process	
<b>Effective Date</b>	<b>January 1, 2004</b>	<b>January 1, 2004</b>
<b>Routine Monitoring</b>	1 sample per quarter per plant at maximum residence time	1 sample per year per plant in month of warmest water temp. If sample or average of annual samples exceeds MCL, then increase to 1 sample per quarter per plant. To return to routine monitoring, TTHM's $\leq$ .060 mg/L and HAA5's $\leq$ .045 mg/L as an annual average
<b>Reduced Monitoring Criteria</b>	TTHM's $\leq$ .040 mg/L and HAA5's $\leq$ .030 mg/L as an annual average after 1 year's data	TTHM's $\leq$ .040 mg/L and HAA5's $\leq$ .030 mg/L for 2 consecutive years <b>OR</b> TTHM's $\leq$ .020 mg/L and HAA5's $\leq$ .015 mg/L for 1 year
<b>Reduced Monitoring</b>	1 sample per year per plant in the month of warmest water temperature at maximum residence time	1 sample per 3 years per plant in the month of warmest water temperature at maximum residence time
<b>Return To Routine Monitoring If:</b>	TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L	TTHM's > .060 mg/L <b>OR</b> HAA5's > .045 mg/L
<b>Compliance</b>	<p>Failure to monitor will be treated as a monitoring violation for the entire annual average period If a system fails to complete 4 consecutive quarters of monitoring, then compliance will be based on the average of the available data.</p> <p><b>For quarterly monitoring</b>, compliance is based on a running annual average, computed quarterly, of quarterly averages of all samples collected.</p> <p><b>For less than quarterly monitoring</b>, compliance is based on all samples taken that year.</p> <p>If the yearly average exceeds the MCL, then the system must increase to quarterly monitoring. The system then would not be out of compliance until 1 year of quarterly monitoring is completed, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL. The system would then be in violation at the end of the quarter. If you are required to increase to quarterly samples, then the sample that initially exceeded the MCL must be included in the running annual average with the following three samples. If the running annual average of any 4 consecutive quarters exceeds the MCL, then the system is in violation and must notify the DDW and the public.</p>	
<b>Reporting</b>	<p><b>If system monitors quarterly or more often</b>, report is due 10 days after the quarter ends <b>If monitoring quarterly or more often</b>, report: number of samples taken, locations, dates, and results of all samples, average of all samples, and whether the MCL was violated.</p> <p><b>If system monitors less than quarterly</b>, report is due 10 days after the monitoring period ends <b>If system monitors less than quarterly but at least annually</b>, you shall report: number of samples taken, locations, dates, and results of all samples, average of all samples, and whether MCL was violated. <b>If monitoring less than annually</b>, you shall report: location, date, and result of last sample, and whether MCL was violated.</p>	
<b>Monitoring Plan</b>	<p>All systems must develop a monitoring plan and have it available for inspection by the DDW and the public. Surface water systems &gt; 3,300 must submit their plan to the DDW.</p>	